

Application No. 10/075,981
Docket No. DP-302458
Amendment dated August 15, 2003
Reply to Office Action of May 15, 2003

Amendments to the Specification:

Please replace paragraph [0005] with the following amended paragraph:

[0005] The present invention provides an encapsulation material suitable for dissipating heat generated by an electronic module, such as by directly contacting a heat-generating power device or contacting a heat sink of a heat-generating power device. The encapsulation material comprises phase change particles dispersed in a polymer matrix material ~~gel~~ material. The particles preferably comprise a metallic alloy encapsulated by a dielectric coating so the particles are electrically insulated from each other. The encapsulation material may further comprise dielectric particles dispersed in the polymer matrix material ~~gel~~ material for the purpose of increasing the thermal conductivity of the encapsulation material. Alternatively or in addition, the dielectric coating on the particles may comprise dielectric particles that are dispersed in a dielectric matrix, again with the preferred effect of increasing the thermal conductivity of the encapsulation material.

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Please replace paragraph [0006] with the following amended paragraph:

[0006] According to the invention, the metallic alloy particles enable the encapsulation material to perform as a solid-to-liquid phase change material having characteristics highly desirable for use in electronic applications. For example, the encapsulation material is thermally conductive and has relatively high thermal capacitance during the phase change as a result of the presence of the metallic alloy particles, yet can be used in the form of a semisolid gel capable of containing the molten metallic particles so as not to require complicated sealing or containment over the operating temperature range of the particular electronic application. As a result of the polymer matrix material ~~silicone gel matrix~~, the encapsulation material of this invention is electrically nonconductive and capable of stopping liquid and ionic intrusion, and therefore is suitable as a potting material. In addition, preferred polymer matrix materials ~~have the silicone gel matrix has~~ low ionic content for corrosion resistance, a low modulus to minimize thermally-induced mechanical stresses, good adhesion properties, and stable material properties even after long exposures within operating environments typically required of electronic devices.